

Public Utilities Commission

Docket No. 05-0145

O`ahu Power Plant

Testimony of

Denise E. Antolini, J.D.

re: Legal Regime for Wave Power

LOL T-11

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4 My name is Denise E. Antolini. My home address is 59-463 Alapio Road, Haleiwa,  
5 Hawaii, 96712.

6 I am an Associate Professor of Law at the William S. Richardson School of Law,  
7 University of Hawaii at Mānoa. I am also the Director of the Law School's  
8 Environmental Law Program.

9 I am not testifying on behalf of the University of Hawaii, the Law School, or the  
10 Environmental Law Program. I am testifying in my personal capacity as a pro bono  
11 (volunteer) legal consultant to Life of the Land.

12 I will provide testimony on important studies and web sites that discuss the legal regime  
13 related to wave power.

14

#### 15 **Education and Background**

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17 I have practiced as an attorney or law professor in the field of environmental law for  
18 almost 20 years. I attended Princeton University, graduating *magna cum laude* in 1982,  
19 with an A.B. I graduated from Boalt Hall School of Law, University of California at  
20 Berkeley, with a J.D. in 1986. While at Boalt, I served as Editor-in-Chief of *Ecology*  
21 *Law Quarterly*, a leading national law journal focused on environmental law. I also  
22 received my Masters in Public Policy from U.C. Berkeley in 1985. After graduation, I  
23 served for two years as the judicial law clerk to the Honorable Joyce Hens Green, United

1 States District Court Judge for the Federal District Court of the District of Columbia.  
2 After my clerkship, I started practicing environmental law in Seattle, Washington as an  
3 associate attorney with Sierra Club Legal Defense Fund (SCLDF) (now called  
4 Earthjustice). I voluntarily transferred to the Mid-Pacific (Honolulu) office of SCLDF in  
5 1990, where I served as a Project Attorney, Staff Attorney, and then Managing Attorney.  
6 At SCLDF, I litigated several major environmental cases, including cases under the  
7 National Environmental Policy Act, the Endangered Species Act, the Clean Water Act,  
8 FERC licensing, Hawaii state environmental statutes such as Chapter 343, the Hawaii  
9 State Water Code, public trust doctrine, and traditional and customary rights. While I  
10 was practicing with SCLDF, I began teaching Environmental Litigation Seminar at the  
11 William S. Richardson School of Law. In Fall 1996, I joined the Law School faculty as a  
12 full-time Assistant Professor. I was promoted and tenured as an Associate Professor in  
13 2003. In 2003-04, I received a Fulbright Scholarship to serve as the Distinguished Chair  
14 of Environmental Studies at the Politecnico di Torino, in Torino (Turin), Italy. I  
15 currently serve as the Director of the Environmental Law Program. The courses I have  
16 taught include Torts, Environmental Law, Domestic Ocean & Coastal Law, International  
17 Environmental Law, Legal Practice (writing), and Second-Year Seminar. I have  
18 completed several major studies, including a year-long study of the State of Hawaii's  
19 governance structure for marine protected areas (for the Department of Land and Natural  
20 Resources). I recently completed a contract, through the University of Hawaii, with  
21 NOAA's National Ocean Service Office of Coast Pilot, that included a comprehensive  
22 update of laws applicable to Hawaii mariners related to navigational safety, homeland  
23 security, and environmental integrity.

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2 I have also published scholarship in the environmental/torts field, including articles on  
3 public nuisance, public trust, and punitive damages. I am currently working on two book  
4 projects, one of which focused on common law theories of environmental litigation (with  
5 Prof. Cliff Rechtschaffen of Golden Gate Law School), and the other focuses in Hawaii's  
6 land use and environmental law (with Prof. David Callies, of the William S. Richardson  
7 School of Law). One of my current areas of research is climate change and renewable  
8 energy law and policy, with a particular emphasis on Hawaii. I will be presenting a paper  
9 on these issues at Tsinghua University in Beijing in October 2006. I am the past Chair of  
10 the Natural Resources Section of the Hawaii State Bar Association. In 2002, I received  
11 the Community Service Award from Hawaii Women Lawyers. In addition, from July  
12 2005 – August 2006, I served as the Chair of the State of Hawaii Environmental Council.  
13 As an appointee of by Governor Linda Lingle and confirmed by the Senate, my term ends  
14 in July 2008. As part of my Council responsibilities, I am assisting in preparation of our  
15 Annual Report to the Governor and the Legislature, which focuses this year on the topic  
16 of renewable energy policy in Hawaii. I am also on the American Bar Association's  
17 Standing Committee on Environmental Law and serve as the Vice-Chair for Public  
18 Service of the Marine Resources Committee of the ABA's Section on Environment,  
19 Energy, and Resources (SEER).

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### 21 **Oral Testimony**

22 I will be leaving Hawaii in December 2006 for a semester of administrative leave in  
23 Florence, Italy. Therefore, I respectfully would request to have any opportunity for my

1 live testimony scheduled well prior to my departure date. Thereafter, I am able to be in  
2 contact only via email and telephone.

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4 LEGAL REGIME FOR WAVE ENERGY

5 Ocean Energy Systems are facilities that are located either on-shore or off-shore and  
6 which utilize ocean water to provide thermal heating/cooling and/or the production of  
7 electricity. These include: Ocean Thermal Energy Conversion (OTEC), Sea Water Air  
8 Conditioning (SWAC), and Wave Power Systems.

9

10 Wave energy is derived from the natural circular motion of waves, determined by several  
11 factors, such as the speed and duration of the wind, the sea area, the water depth, and the  
12 conditions of the seabed. Waves are formed by winds blowing over the water surface.

13 Wave energy has a higher power density than solar and wind energy. It can provide a  
14 more predicable power source because of the continuous natural cycles of waves.

15

16 According to the Electric Power Research Institute (EPRI), located in Stanford,  
17 California, there are a number of mature and promising ocean power devices under  
18 development, some of which have already been tested, including in Kāne`ohe, Hawai`i.

19

20 EPRI was established in 1973 as an independent, non-profit center for public interest  
21 energy and environmental research. It brings together member organizations, the  
22 Institute's scientists and engineers, and leading experts to work collaboratively on  
23 solutions to the challenges of electric power. More information about EPRI can be found

1 on their web site: [www.epri.com](http://www.epri.com).

2

3 EPRI's Ocean Energy Program is intended to benefit the public by making all of its  
4 technical work transparent and available on its web site. The site currently contains 20  
5 studies of, and briefings on, Wave Energy, including the EPRI WP-003-HI, Hawaii Site  
6 Survey; EPIR WP-006-HI, Hawaii System Level Design Study; EPRI WP-007-US,  
7 Environmental Issues Study; and EPRI WP-008-USA, Regulatory Issues Study. The site  
8 also contains over 15 studies on Tidal Energy, including a study on environmental and  
9 regulatory issues in North America (EPRI TP-007-NA).

10

11 I am sponsoring as exhibits:

12 LOL-EXH-ENV-2 EPRI Wave Energy Environmental Issues study (December 2004)

13 [www.epri.com/oceanenergy/attachments/wave/reports/007\\_Wave\\_Envr\\_Issues\\_Rpt.pdf](http://www.epri.com/oceanenergy/attachments/wave/reports/007_Wave_Envr_Issues_Rpt.pdf)

14 which focused specifically on the regulatory issues associated with ocean energy, using  
15 the Kāne`ohe Bay project in Hawai`i as an example; and

16 LOL-EXH-ENV-3 Wave Power in the U.S: Permitting and Jurisdictional Issues

17 [www.epri.com/oceanenergy/attachments/wave/reports/008\\_Wave\\_Permitting\\_Issues\\_Fin](http://www.epri.com/oceanenergy/attachments/wave/reports/008_Wave_Permitting_Issues_Fin)

18 [al.pdf](#).

19 Q. What are the major policy arguments that support wave energy development?

20 A. According to EPRI, the benefits include: (1) economic benefits to coastal states  
21 from the construction, operation, and maintenance of waver power plants; (2) with proper  
22 siting, wave energy production is considered "one of the most environmentally benign  
23 ways to generate electricity"; (3) wave energy conversion (WEC) devices usually have a

1 low profile and are generally located far from shore, and therefore raise fewer siting  
2 objections; (4) wave energy is more predictable than solar or wind power, providing more  
3 reliable power for the grid; and (5) wave energy provides coastal states a direct way to  
4 diversify and balance their energy portfolio.

5 Q. What are the major legal issues associated with wave energy development?

6 A. EPRI published a Wave Energy Environmental Issues study in December 2004  
7 specifically on the regulatory issues associated with ocean energy, using the Kāne`ohe  
8 Bay project in Hawai`i as an example. I have reviewed the report and find it to be a fair  
9 and balanced summary of the legal issues related to permitting of ocean power. The  
10 reports concludes that, while there are some regulatory barriers, these primarily result  
11 from the lack of agency and developer experience in permitting, overlapping  
12 jurisdictions, and the lack of a national energy policy that encourages ocean power. The  
13 report concludes that, although there is a need for more data on environmental impacts,  
14 no serious marine effects have yet been associated with ocean power. In general,  
15 planning for any ocean energy systems will require a thorough review of all  
16 environmental impacts and permitting issues, including aesthetics, wildlife impacts, water  
17 quality, cultural impacts, visual impacts, ceded lands, public trust, and recreational and  
18 navigational safety. With advanced planning and early and sincere community  
19 consultation, the regulatory challenges to permitting can be substantially reduced and,  
20 with some legislative/policy intervention, can be streamlined.

21 Q. What are the key factors that will affect the legal regime for any particular project?

22 A. The key determinant of the legal issues involved with wave energy development  
23 will include: (1) the specific location (e.g., miles offshore), which affects state or federal

1 governmental jurisdiction; (2) the funding source and amount, which may trigger various  
2 environmental laws (e.g., NEPA); (3) any special site characteristics (e.g., migration  
3 pathways); and (4) project design (e.g., profile and cabling system), which may increase  
4 or mitigate impacts. In Hawaii, the agency most involved in permitting will likely be the  
5 Department of Land and Natural Resources (DLNR) because of the use of and impact on  
6 marine resources. Because of potential impacts on cultural issues and ceded lands, the  
7 Office of Hawaiian Affairs (OHA) should also be involved in any permitting issues.

8 Q. Are there other good sources of information on the regulatory regime related to  
9 ocean power?

10 A. Yes, another good source is the “Ocean Energy Resource Web Site” of Attorney  
11 Carolyn Elefant at: [www.his.com/~israel/loce](http://www.his.com/~israel/loce). Ms. Elefant is affiliated with the offices  
12 of Scott Hempling, sponsors of Ocean Energy Resources  
13 ([www.his.com/~israel/loce/ocean.html](http://www.his.com/~israel/loce/ocean.html)), and the LOCE Wind and Wave Energy Weblog  
14 ([www.renewablesoffshore.blogspot.com](http://www.renewablesoffshore.blogspot.com)). According to the site, LOCE is the “only  
15 comprehensive on-line source of information on the myriad of federal and state laws and  
16 regulations which affect the licensing and siting of ocean energy and offshore renewable  
17 projects in the United States as well as the sale of power from those projects to electric  
18 utilities and consumer.”

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20 I am sponsoring as exhibits:

21 LOL-EXH-ENV-21 Barriers to Ocean Energy Development by Carolyn Elefant (June  
22 2004) [www.getf.org/ewebeditpro/items/O70F4074.pdf](http://www.getf.org/ewebeditpro/items/O70F4074.pdf)

23 LOL-EXH-ENV-24 Summary Table on Offshore Regulations by Carolyn Elefant

1 (March 2003) [www.his.com/~israel/loce/table.pdf](http://www.his.com/~israel/loce/table.pdf)

2 LOL-EXH-ENV-22 Federal Energy Regulatory Commission (FERC) AquaEnergy

3 decision (102 FERC 61,242)

4 [elibrary.ferc.gov/idmws/common/opennat.asp?fileID=9647239](http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=9647239)

5 Q. Does this conclude your testimony?

6 A. Yes, it does.

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